



Rural Missouri Asset Mapping:

A Mapping Analysis of Demographic, Infrastructure, and Entrepreneurial Resources in Rural Missouri

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Missouri Economic and Research Information Center
Missouri Department of Economic Development

Introduction

Rural counties in Missouri are experiencing challenges in expanding economic opportunities due to a changing global economy. In facing these challenges, counties will need to take inventory of assets they hold to ensure that they can be competitive in order to take advantage of economic prospects. Previously, traditional assets considered to be important to rural economic development were affordable land and labor.

This report will consider different assets for rural counties to consider when determining economic development planning. Rural counties in this analysis are counties that are not a part of a Metropolitan Statistical Area. The assets are population assets, infrastructure assets, entrepreneurial assets, and economic catalysts.

Population assets will analyze population of small cities and its surrounding area, commuting population, and foreign-born population. Infrastructure assets will analyze education, transportation networks, and access to high-speed internet. Entrepreneurial assets will analyze data determining the quantity and quality of entrepreneurial activity in a county. Economic catalyst will analyze the major industries that impacts employment on a county level.

The analysis also includes a discussion of the Tourism and Agriculture industry and the role it plays in the economic health of rural Missouri.



Population Assets

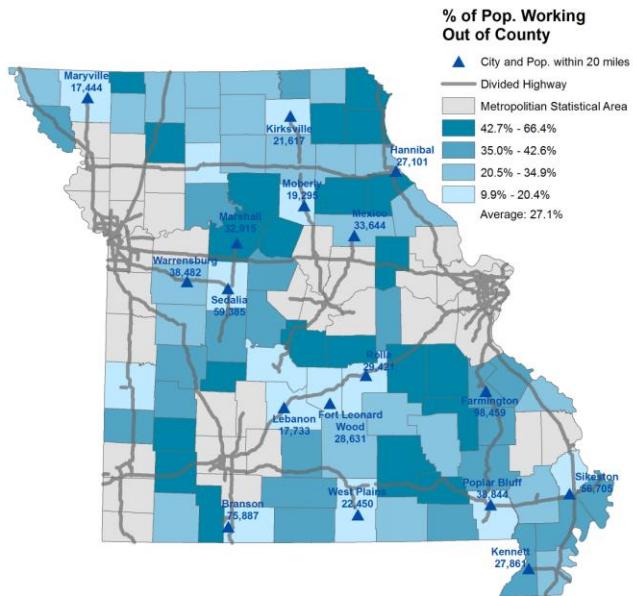
Small cities are the center of employment in rural areas due to access of services and infrastructure. These small cities also draw a commuting population from surrounding counties. To determine what population small cities are surrounded by, cities with a population of 10,000 or larger were used and a 20 mile radius was created around each city to calculate the population surrounding each city. Additionally, the percentage of population working out of county was calculated.

17 cities in rural counties have populations of 10,000 or more. Cities with the largest population within 20 miles are Farmington (98,459), Branson (75,887) and Sedalia (59,385). Additionally several towns are clustered in proximity to each other, such as Lebanon, Ft. Leonard Wood, and Rolla, totaling a population of 75,785 and Marshall, Sedalia, and Warrensburg totaling 130,782.

Additionally, wherever the larger cities are located, they tend to act as a magnet for out-of-county commuters. Adair, Butler, Howell, Nodaway, Phelps, Pettis, Pulaski, and Taney counties have no more than 16% of the population working out of county. Surrounding counties had 21% - 55% of the population working out-of-county. Caveats to keep in mind are that some counties are located near metropolitan areas, such as St. Louis and Springfield, which may attract workers.

Immigration

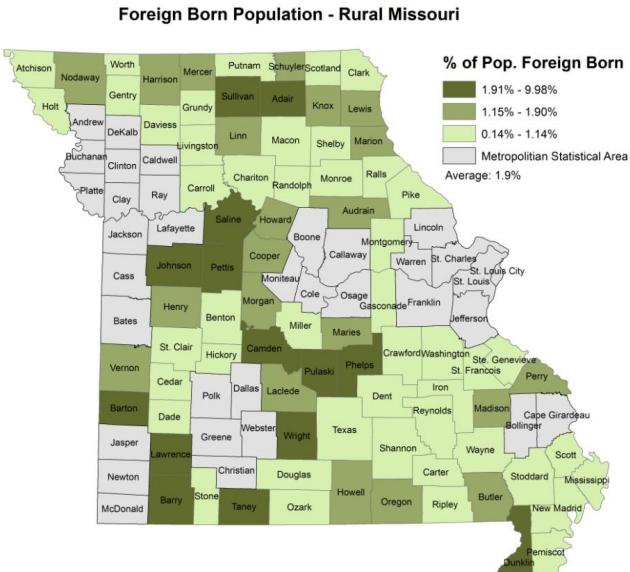
Immigration is a population asset that could determine economic vitality in a region. Studies have shown that the concentration of foreign-born residents have a positive relationship with the quality of entrepreneurs in an area.¹ An indicator to measure immigration in counties is the "Percent of Population, Foreign Born," collected from the U.S. Census' American Community Survey.



¹ Low, S., Henderson, J. & Weiler, S. (2005), "Gauging a Region's Entrepreneurial Potential." Federal Reserve Bank of Kansas City. p.73.

Rural Missouri's foreign-born percent of population average is 1.9%. Fourteen counties had foreign-born populations higher than the rural average. The counties with the largest percent were Sullivan (10%), Pettis (6.6%), and Saline (5.7%) counties. Counties where foreign born populations are larger tend to be employed in agriculture, construction, and manufacturing.² Sullivan, Pettis, and Saline counties have large agriculture or food manufacturer sectors, which tend to attract immigrants.

Other counties that had large foreign-born populations were ones that had universities. Additionally tourist counties like Camden (2.3%) and Taney (4.3%) have high percentages.³



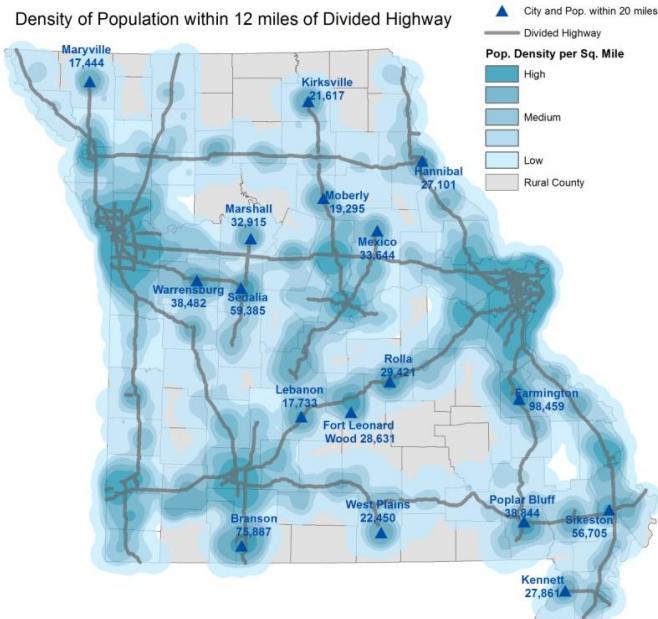
Source: U.S. Census, American Community Survey 2009 - 2013

Infrastructure Assets

Infrastructure is categorized in this report to include education, broadband internet access and transportation. An educated population is needed to ensure a well-trained workforce. Internet access and transportation are necessary to have in order to conduct business remotely and to have access to goods and services.

Transportation

Determining transportation access for rural counties was based on access to four-lane highways, which would allow for ease of



² Population Dynamics Are Changing the Profile of Rural Areas, USDA Economic Research Services, 4/1/2007 <http://www.ers.usda.gov/amber-waves/2007-april/population-dynamics-are-changing-the-profile-of-rural-areas.aspx#.Vdc63vIvko>

³ U.S. Census Bureau; American Community Survey, 2008-2013 American Community Survey 5-Year Estimates, Table S1501; generated by Maurice Harris; using American FactFinder; <<http://factfinder2.census.gov>>; (7 August 2015).

access. This would include interstate and U.S. highways. Additionally, there was a calculation of the population that lived within a 12 mile radius of a four-lane highway, which would estimate the distance of a 15-minute drive.

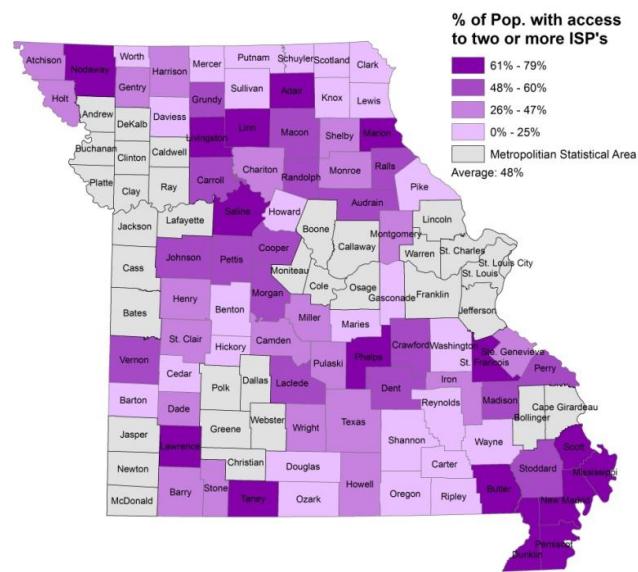
Nearly 78% of the rural population, or 1.2 million people, live within a 12 mile radius of a four-lane highway. Additionally, nearly all the major cities with populations over 10,000 are located on a major four-lane highway.

Internet Access

Broadband internet access is an important asset for rural counties to have. An indicator to determine access to broadband internet is the percent of the population in a county with access to two or more internet service providers (ISP's). If a county has two or more ISP's then it assumes that there is easy availability to high-speed internet access.

According to the FCC's *Broadbandmap.gov*, broadband access in rural Missouri has several hotspots. The average for rural Missouri population with access with two or more ISP's is 48%.⁴ Southeast Missouri, encompassing Butler, Dunklin, Mississippi, New Madrid, Pemiscot, Scott, and Stoddard counties, has 52% to 74% of the population with access to two or more ISP's.⁵

Counties that have large populations with access to two or more ISP's are home to post-secondary educational institutions. Counties such as Adair, Butler, Marion, Nodaway, Phelps, and Vernon have a high percentage of the population with access to two or more ISP's. These counties have colleges located their such as Truman State University (Adair County), Northwest Missouri State University (Nodaway County), and Missouri University of Science and Technology (Phelps County).



Source: www.broadbandmap.gov, Federal Communications Commission

⁴ Number of Wireline Service Providers Greater than 2

<http://www.broadbandmap.gov/rank/all/county/missouri/percent-population/number-of-wireline-service-providers-greater-than-2/ascending/>. Accessed August 12,2015.

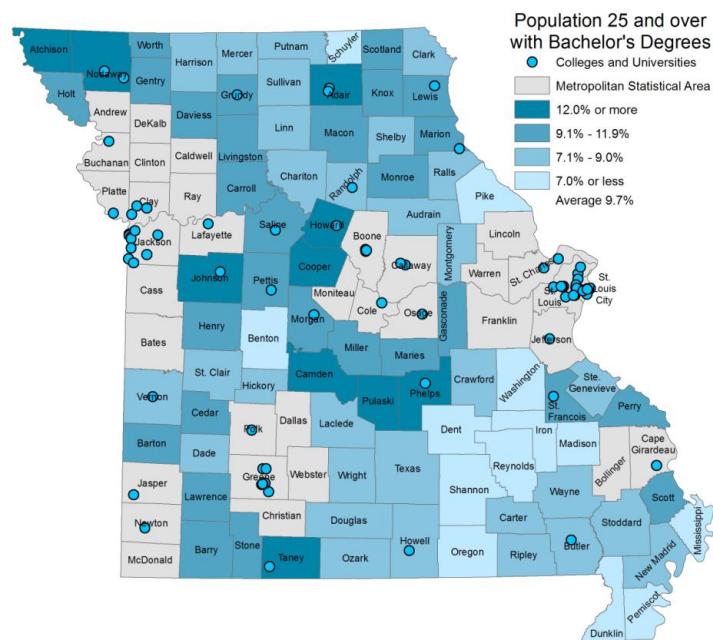
⁵ Number of Wireline Service Providers Greater than 2

<http://www.broadbandmap.gov/rank/all/county/missouri/percent-population/number-of-wireline-service-providers-greater-than-2/ascending/>. Accessed August 12,2015.

Education

A population's educational attainment is viewed as an important asset for rural areas. The critical thinking skills and knowledge that an educated population contains are vital for successful businesses to have.⁶ Counties that have a significant population of college-educated people tend to attract employers and can be a base for people who could start new businesses. To measure educational attainment the indicator of the "Percent of Population age 25+ with a Bachelor's Degree" from the U.S. Census' American Community Survey is used.

The rural Missouri average percentage of population with Bachelor's degrees is 9.7%. The counties with the highest percent of population with Bachelor's degrees were Atchison (14.9%), Adair (14.3%), Camden (12.8%), and Cooper (12.5%).⁷ While there were a college or university located in counties that had a large percentage of the population with bachelor's degrees such as Adair and Nodaway counties, there were several counties that had a significant college-educated population that do not host an educational institution such as Camden and Cooper counties.



Source: U.S. Census, American Community Survey 2009-2013

⁶ Low, S., Henderson, J. & Weiler, S. (2005), "Gauging a Region's Entrepreneurial Potential." Federal Reserve Bank of Kansas City. P.73.

⁷ U.S. Census Bureau; American Community Survey, 2008-2013 American Community Survey 5-Year Estimates, Table S1501; generated by Maurice Harris; using American FactFinder; <<http://factfinder2.census.gov>>; (7 August 2015).

Entrepreneurial Assets

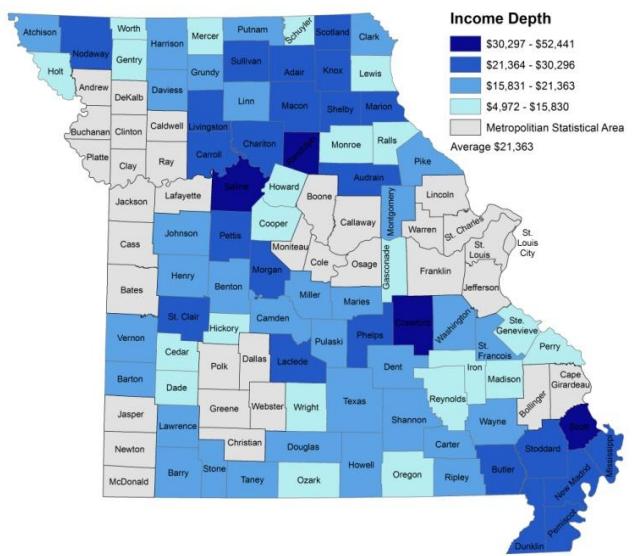
Entrepreneurial breadth and depth are two concepts that measure the concentration and impact of entrepreneurial activities in a county.

Entrepreneurial breadth assesses the quantity of activity; it reflects the size and variety of small businesses in a county that could create the foundations of economic growth.⁸ Breadth is highest in small, isolated counties due to the need to spawn a large number of small firms to provide goods and services in small volumes.⁹ Entrepreneurial depth measures the quality of activity in a region; it assesses the value these small businesses generate for themselves and the local economy. Depth is higher in more densely populated metro and micropolitan counties since self-employed workers can earn higher average incomes in larger metro counties.¹⁰

The data used to measure these indicators is from the Bureau of Economic Analysis. Breadth is measured by dividing total non-farm proprietor employment by total non-farm employment. Depth is calculated by dividing average non-farm proprietor income by non-farm proprietor employment, which would be the average income per non-farm proprietor.

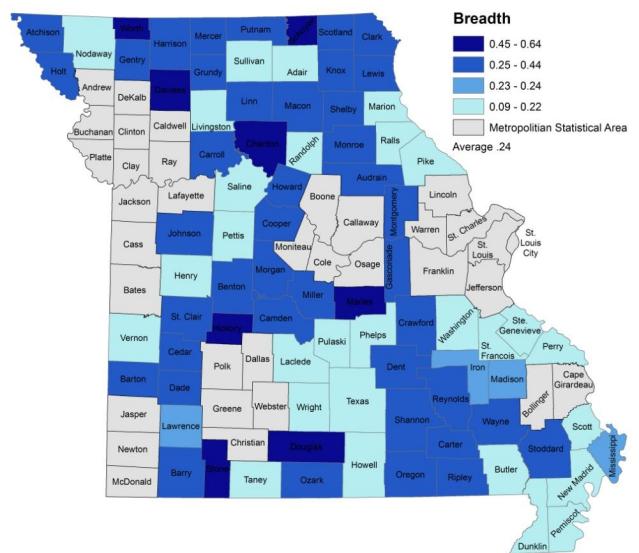
The premise above holds true for Missouri's rural counties. Breadth is lowest in counties that have the larger cities in rural Missouri such as Adair, Howell, Nodaway, Scott, and St. Francois. Counties with

Income Depth of Proprietorships - Rural Missouri



Source: Bureau of Economic Analysis

Entrepreneurial Breadth - Rural Missouri



Source: Bureau of Economic Analysis

⁸ Low, S., Henderson, J. & Weiler, S. p62.

⁹ Low, S., Henderson, J. & Weiler, S. p62.

¹⁰ Low, S., Henderson, J. & Weiler, S. p62.

highest breadth are Maries, Douglas, Worth, and Stone. Regions of the state with the largest breadth measures are North Central and South Central Missouri, which also have lower populations.

Depth is highest in counties with larger populations, with the highest totals in Scott (\$43,495), Saline (\$43,899), and Randolph (\$52,411) counties. Crawford County (\$38,360) also had a large depth measurement. Depth totals were lowest in small population counties such as Worth (\$4,972), Wright (\$6,019), and Reynolds (\$9,979) counties.

Industry Focus: Tourism and Agriculture

Two major industries in rural Missouri are Tourism and Agriculture. The Tourism industry is centered in counties that are close to natural amenities and attraction. Agriculture and related industries are spread throughout the state.

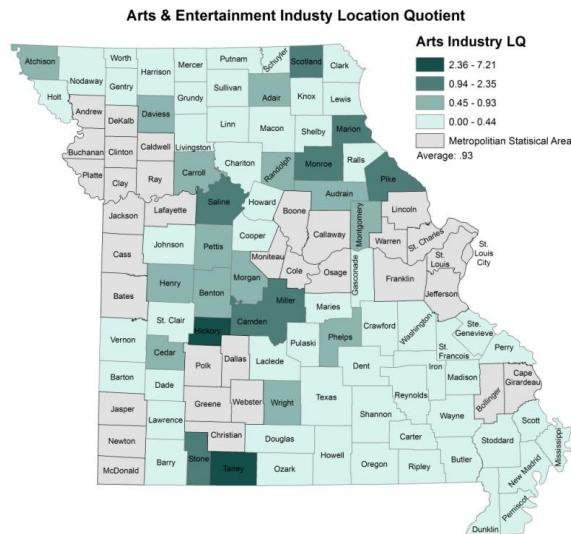
Tourism

The tourism industry in Missouri, while hard to define, can be potentially gauged by the *Arts, Entertainment, and Recreation* and *Accommodation and Food Services* industries.

To determine the concentration of each industry in a county, the location quotient is used. Location quotient (LQ) measures an industry's concentration of employment in a region in relation to the nation. If a county has a LQ greater than 1, the industry is considered highly concentrated compared to the nation.

The average LQ for rural Missouri in the *Arts, Entertainment, and Recreation* industry was

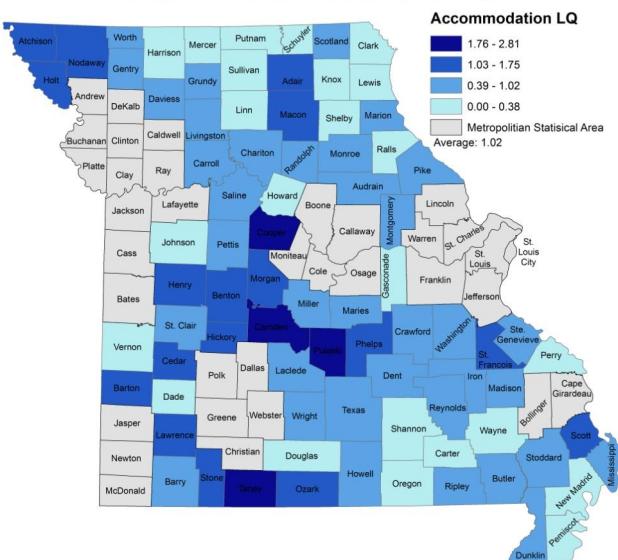
0.93. Ten rural counties in Missouri had a LQ bigger than the average: Taney County (7.21) and Hickory County (5.19).¹¹ These counties are home to entertainment and amenities centers (Branson and Truman Lake). Other counties with higher LQ's were located around the Lake of the Ozarks (Miller and Camden Counties), Hannibal (Marion County), and Mark Twain Dam (Monroe County).



¹¹ Bureau of Labor Statistics, Quarterly Census of Employment and Wages 2013 Annual Data; generated by Maurice Harris; using American FactFinder; < <http://www.bls.gov/cew/> >; (7 August 2015).

The *Accommodation and Food Services* industry is another key industry of the tourism sector. The industry includes hotels, restaurants and related businesses. The average LQ of the industry for rural Missouri was 1.02. Twenty counties had LQ's that were higher than the rural average, with Taney (2.81), Pulaski (2.75), Camden (2.09), and Cooper (2.09) Counties with the highest LQ's overall.¹² Taney and Camden Counties had large LQ's because of being located in Branson and the Lake of the Ozarks respectively. Pulaski County's accommodation LQ is high due to Fort Leonard Wood being located in the county.

Accommodation and Food Services Location Quotient



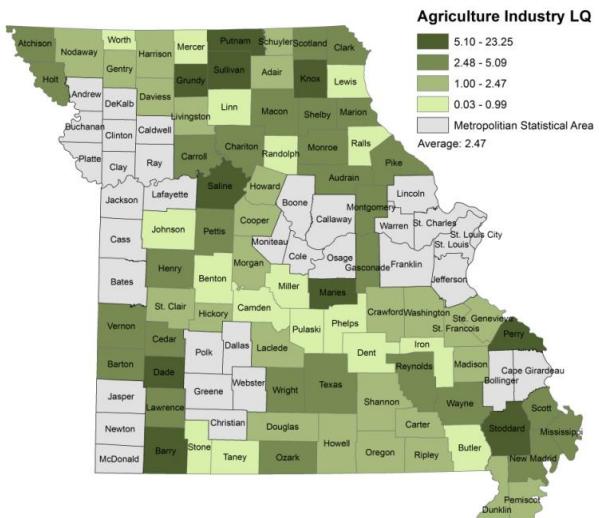
Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Taney County (7.21 and 2.81), Camden County (2.35 and 2.09), Stone County (2.33 and 1.73), Hickory County (5.19 and 1.10), and Marion County (1.10 and 1.00) have high LQ's measures in both *Arts and Entertainment* and *Accommodation and Food* industries. These counties are hot spots for tourism-related industries.

Agriculture

Agriculture and agribusinesses is another major industry in rural Missouri. The state is home to 99,171 farms, the second largest amount in the United States. The industry employs 283,825 workers.¹³ Market value of farm production, which measures the total value of crops and livestock, was \$9.2 billion dollars in 2012. Total agriculture exports in 2014 were \$2.4 billion a 60% increase from 2007's total of \$1.5 billion. The largest sub-sector of agriculture exports were food and kindred products, exporting over 66% of

Agriculture Industry Location Quotient



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

¹² Bureau of Labor Statistics, Quarterly Census of Employment and Wages 2013 Annual Data

¹³ Missouri Economic Research and Information Center. (2015). Missouri Economic Research Brief: Agricultural Industries, pg. 1

exports in the category, totaling \$1.6 billion dollars.¹⁴

Missouri is ranked in the top ten in several categories of animal production. The state is 9th in the inventory of chickens, ranked 8th in inventory of cattle and calves and ranked 4th in supply of turkeys. In terms of field crops, Missouri is ranked 4th in soybean acreage, ranked 2nd in amount of forage land (including hay and haylage), and 11th in total corn acreage.¹⁵

According to the LQ measure, high concentrations of agriculture and agribusiness employment are located in Southwest, Southeast, and Northern Missouri. The average LQ of the industry for rural Missouri was 2.47. 38 counties had LQ's higher than the rural average. The counties with the highest LQ's were Sullivan (23.25), Dade (14.98), Saline (9.13), and Maries (8.10).

Economic Catalysts

Employment concentrations of traditional private-sector, export-oriented industries (manufacturing, agriculture, tourism) or institutional concentrations that bring outside dollars into a region are considered to be economic catalysts for this analysis. Areas where employment in these industries and institutions was more equally distributed were defined as "Diversified".

Economic catalyst considers the top industries that county residents are employed in. This is a distinction from where the actual place of employment is. For example although the facilities are not physically located in Osage County, the income from state government employees living in the county is very important to the local economy. Economic catalysts were determined from industry employment data from the U.S. Census Bureau 2008-2012 5-Year American Community Survey (ACS) estimates.

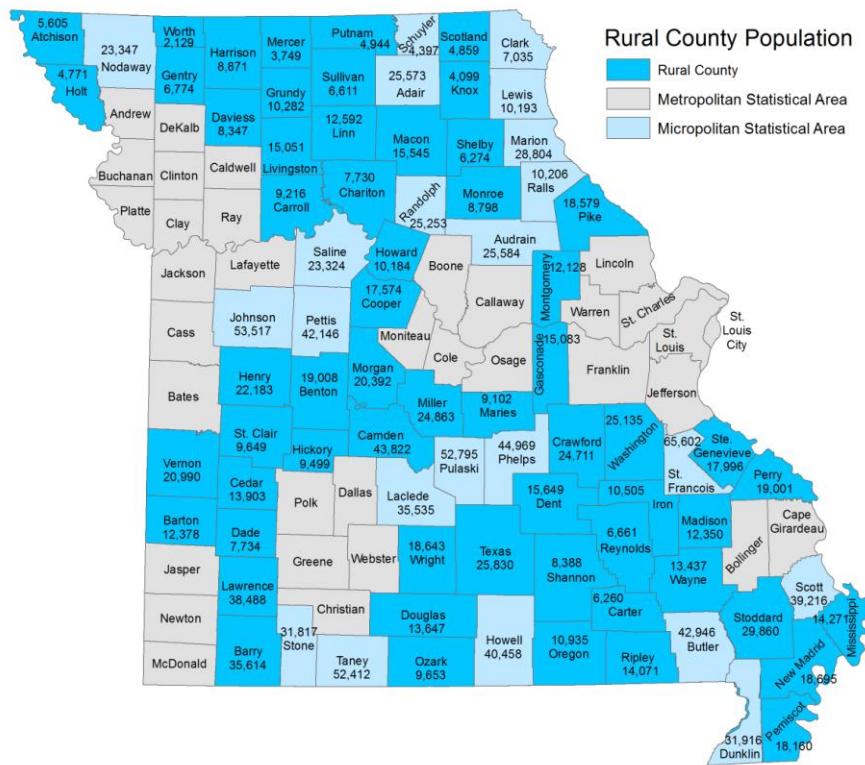
Manufacturing industries were the top employing industry for 36 counties and tourism-related businesses is the main employing industry for eleven counties. Agricultural industries were the top employing industries for six counties. Eighteen counties had diverse employment across industries.



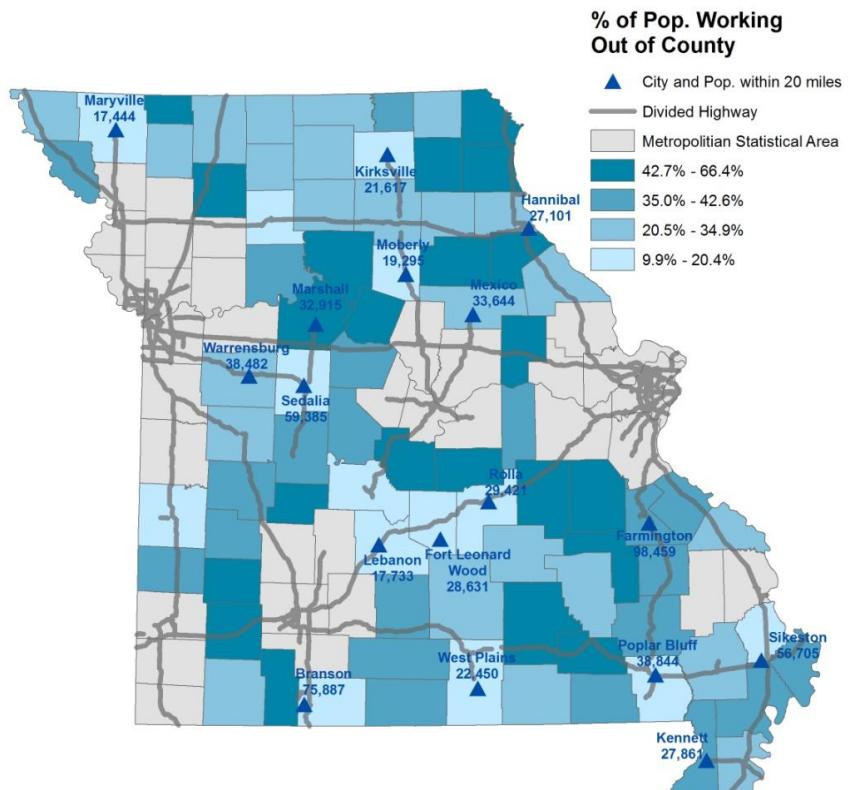
¹⁴ Missouri Economic Research and Information Center, pg. 5

¹⁵ Missouri Economic Research and Information Center, pg. 3

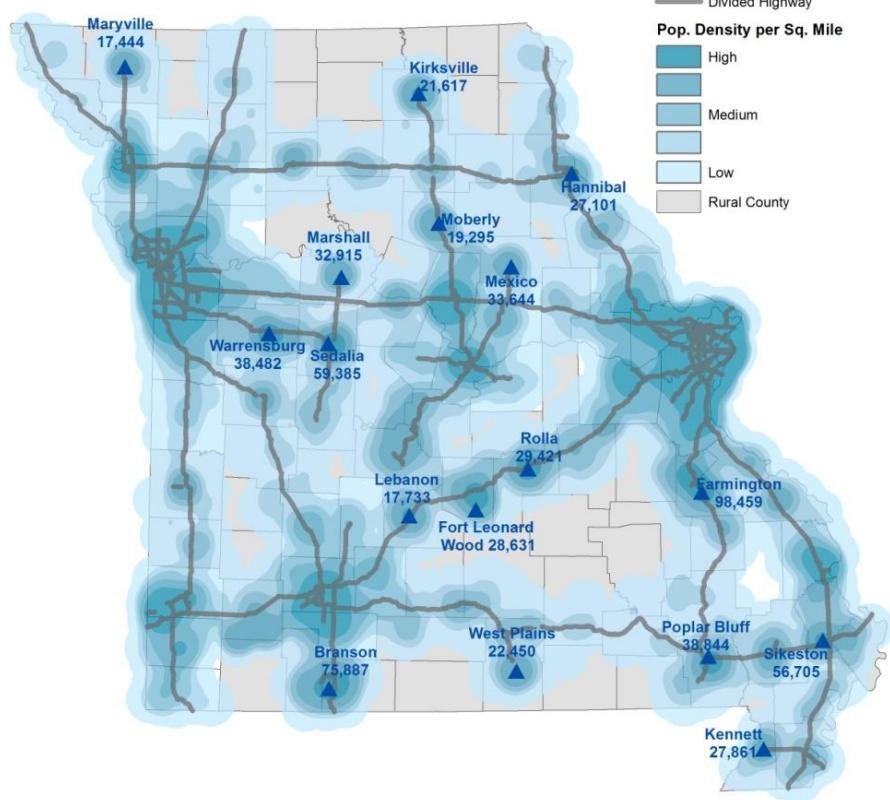
Appendix 1 – County Population, Infrastructure, Industry, and Entrepreneurship Maps



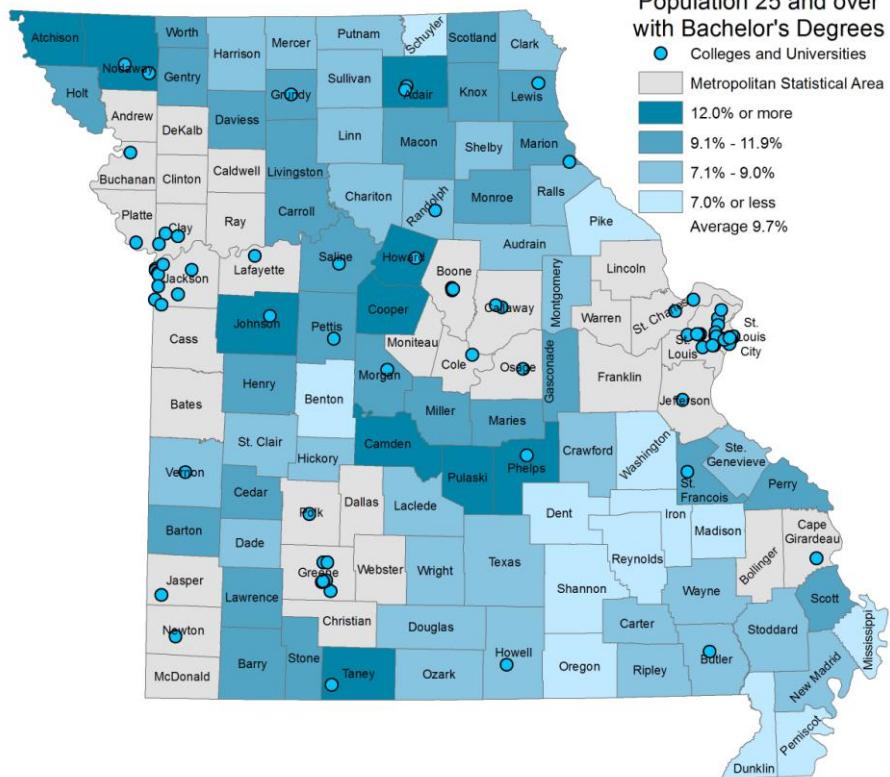
Source: U.S. Census, American Community Survey 2009-2013



Density of Population within 12 miles of Divided Highway

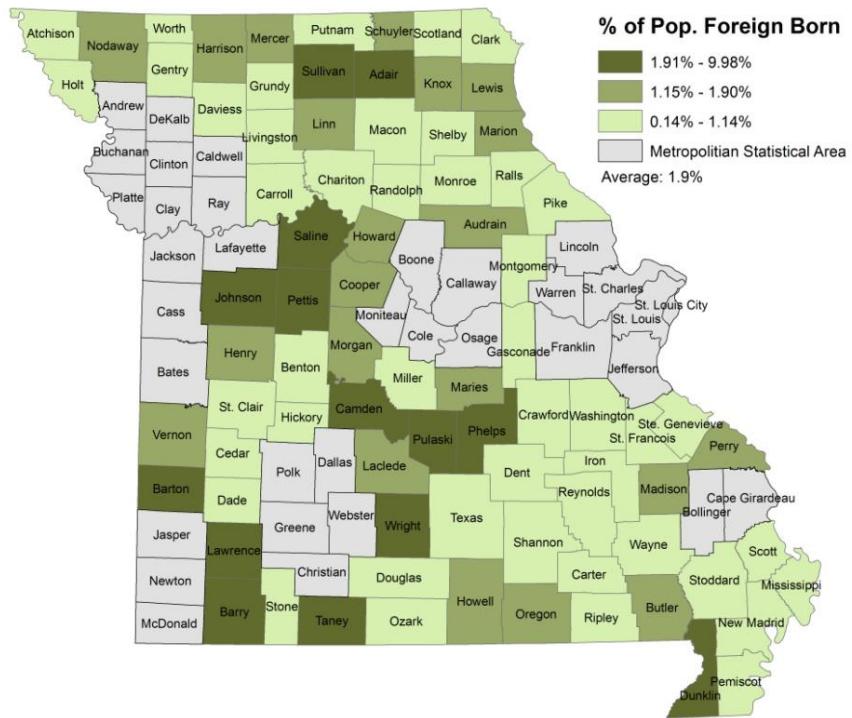


Population 25 and over with Bachelor's Degrees

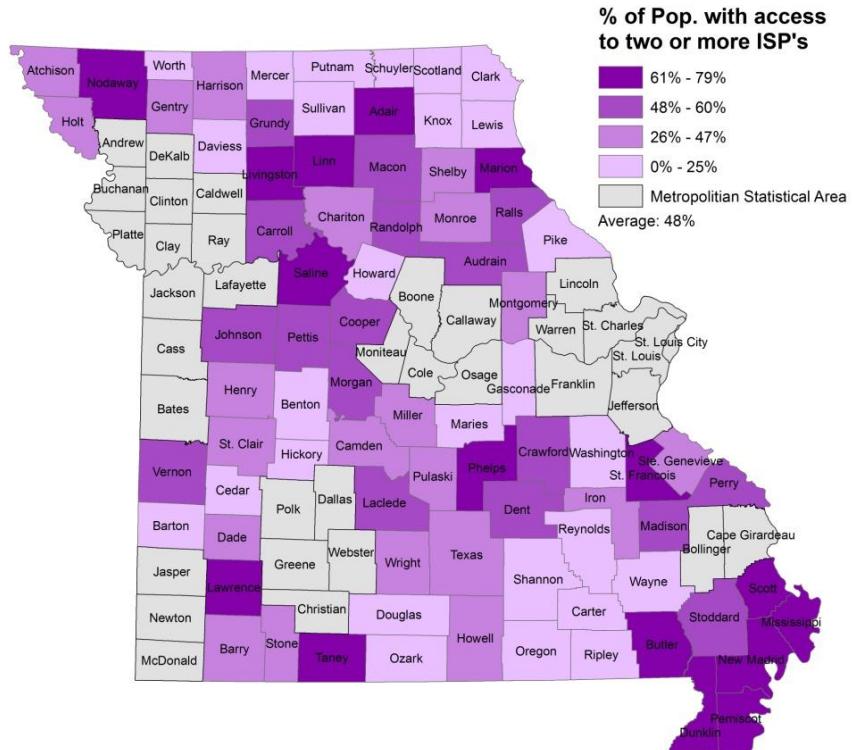


Source: U.S. Census, American Community Survey 2009-2013

Foreign Born Population - Rural Missouri

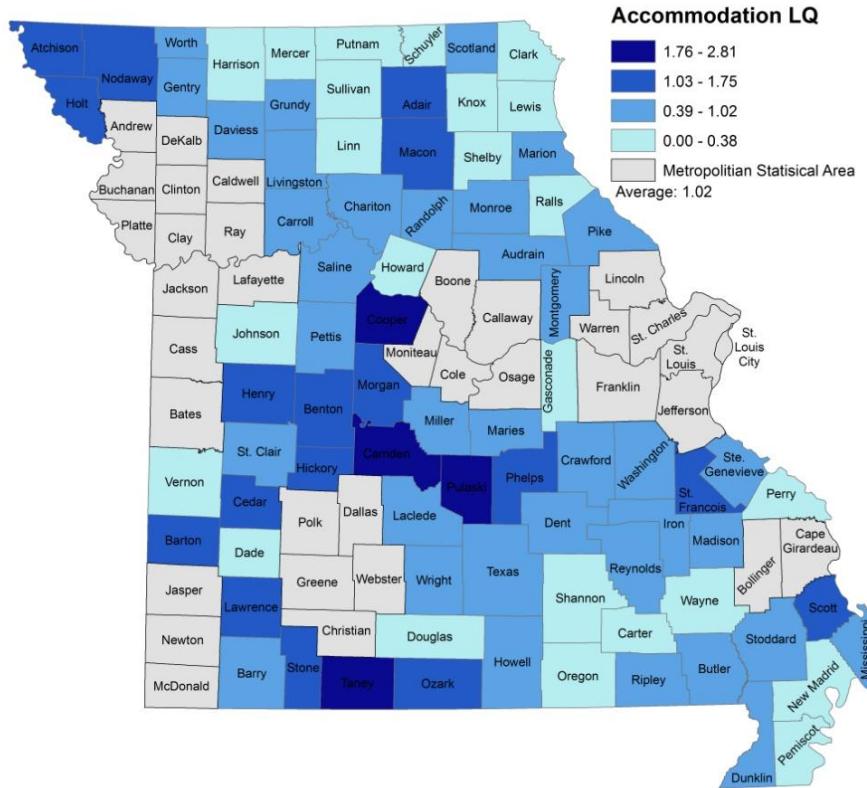


Access to Broadband Internet - Rural Missouri



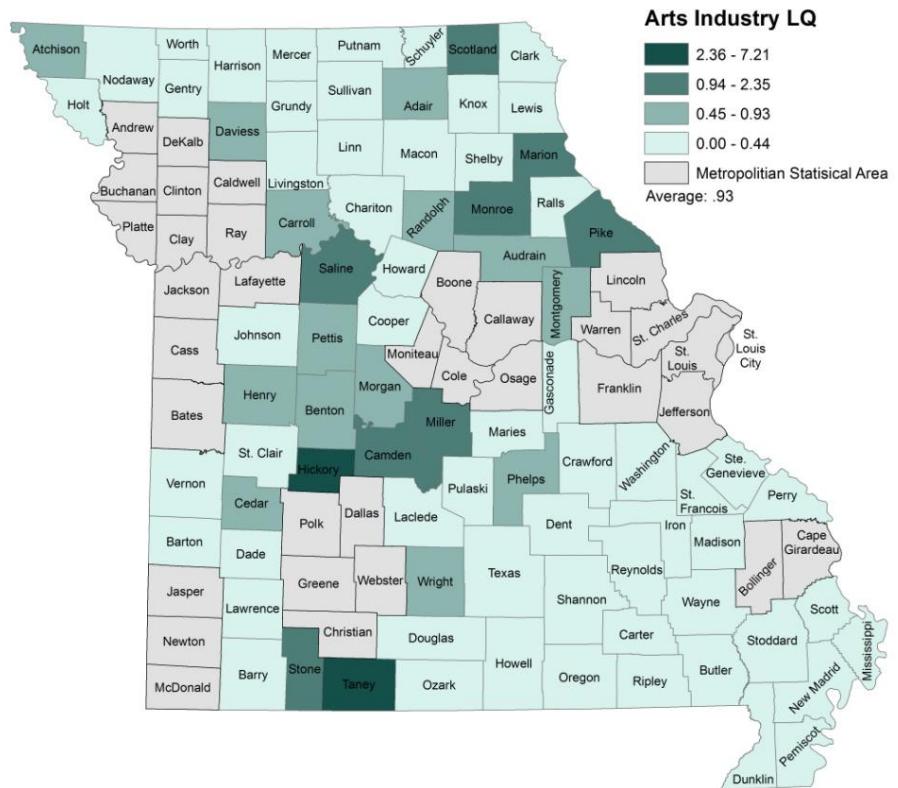
Source: www.broadbandmap.gov, Federal Communications Commission

Accommodation and Food Services Location Quotient



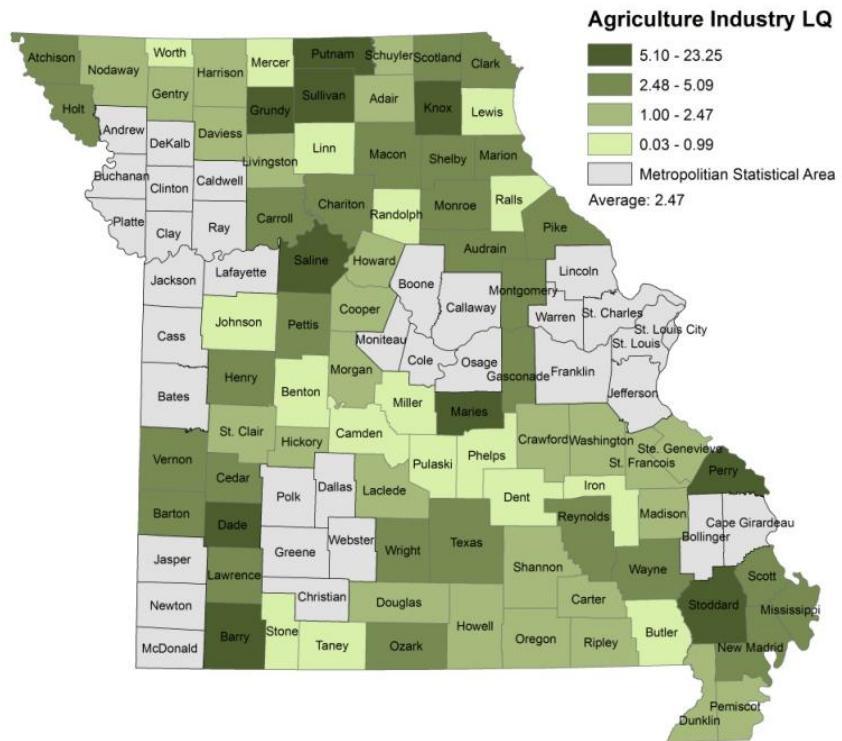
Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Arts & Entertainment Industry Location Quotient



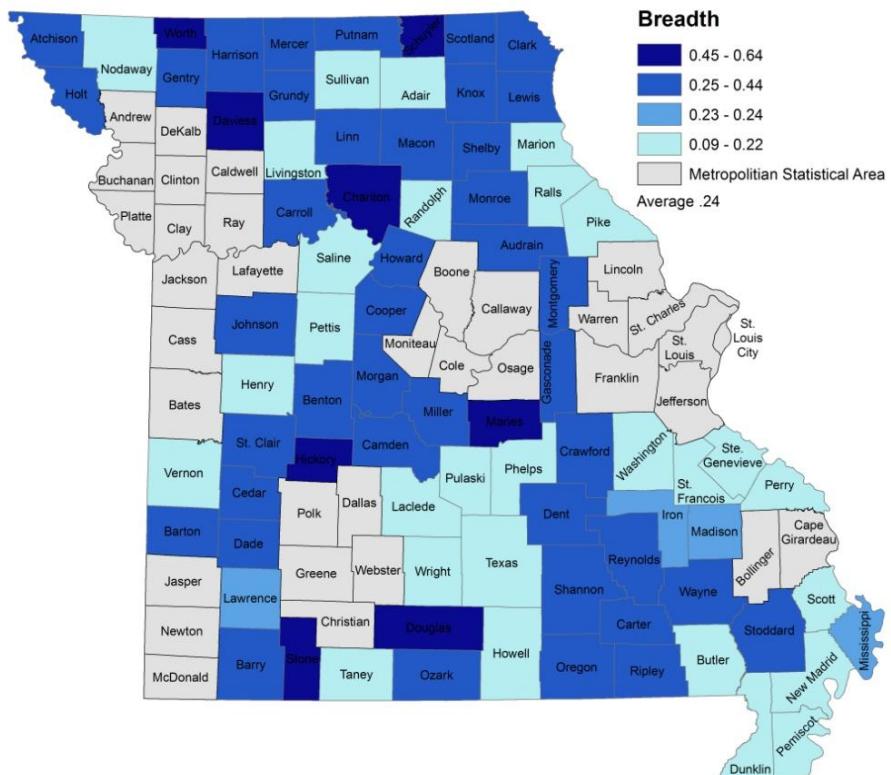
Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Agriculture Industry Location Quotient



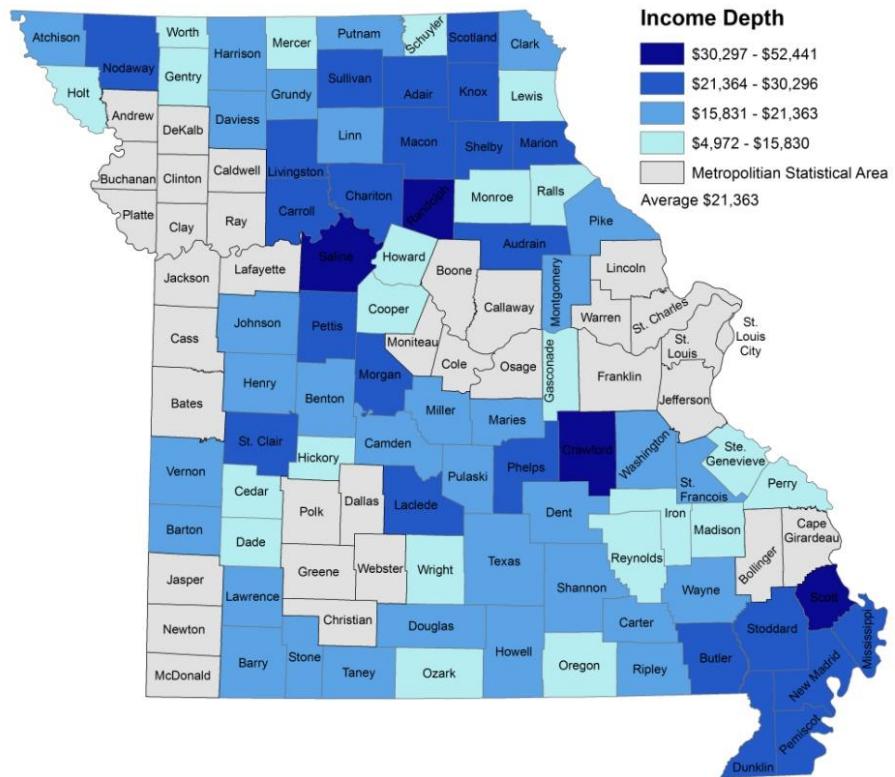
Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Entrepreneurial Breadth - Rural Missouri



Source: Bureau of Economic Analysis

Income Depth of Proprietorships - Rural Missouri



Source: Bureau of Economic Analysis

Top Industry by Employed Population



Appendix 2 – 1 Population and Employment Tables

County	Population 2013	Total Employment – 2013	Non -Farm Proprietor Employment – 2013	% of Pop Age 25+ w/Bachelors Degree	% of Pop Foreign Born
Adair	25,573	14,249	3,025	14.3%	2.4%
Atchison	5,605	2,696	915	14.9%	0.2%
Audrain	25,584	13,322	3,418	8.1%	1.5%
Barry	35,614	19,637	5,233	9.2%	4.4%
Barton	12,378	5,443	1,855	10.7%	2.2%
Benton	19,008	6,886	2,956	6.7%	0.8%
Butler	42,946	24,262	4,599	8.9%	1.2%
Camden	43,822	25,637	8,597	12.8%	2.3%
Carroll	9,216	3,882	1,367	9.9%	1.1%
Carter	6,260	2,468	913	7.8%	0.8%
Cedar	13,903	5,751	2,488	10.8%	1.1%
Chariton	7,730	3,533	1,638	8.2%	0.5%
Clark	7,035	2,693	1,115	8.8%	0.4%
Cooper	17,574	7,613	1,945	12.5%	1.5%
Crawford	24,711	10,798	3,848	8.7%	0.7%
Dade	7,734	2,835	1,099	7.8%	0.7%
Daviess	8,347	3,259	1,566	11.5%	1.1%
Dent	15,649	6,333	1,871	6.8%	0.9%
Douglas	13,647	6,338	3,802	7.3%	0.5%
Dunklin	31,916	12,927	2,506	6.6%	2.6%
Gasconade	15,083	7,625	2,197	11.1%	0.7%
Gentry	6,774	3,288	898	10.7%	0.8%
Grundy	10,282	4,957	1,254	9.4%	1.0%
Harrison	8,871	3,763	1,071	7.9%	1.2%
Henry	22,183	10,053	2,103	9.3%	1.2%
Hickory	9,499	2,394	1,086	7.6%	0.6%
Holt	4,771	2,338	906	10.5%	0.5%
Howard	10,184	3,913	1,123	14.7%	1.3%
Howell	40,458	20,595	4,543	8.4%	1.5%
Iron	10,505	4,498	1,015	6.6%	0.8%
Johnson	53,517	27,795	7,162	15.7%	2.6%
Knox	4,099	1,845	744	9.3%	1.2%
Laclede	35,535	16,428	3,512	8.0%	1.2%
Lawrence	38,488	11,571	2,622	10.9%	2.5%
Lewis	10,193	3,627	964	9.1%	1.7%
Linn	12,592	5,751	1,428	7.1%	1.5%
Livingston	15,051	8,306	1,628	11.7%	0.8%
Macon	15,545	7,037	1,800	9.7%	0.5%
Madison	12,350	5,143	1,191	5.2%	1.4%
Maries	9,102	4,020	2,573	10.8%	1.3%

County	Population 2013	Total Employment – 2013	Non -Farm Proprietor Employment – 2013	% of Pop Age 25+ w/Bachelors Degree	% of Pop Foreign Born
Mercer	3,749	1,326	575	8.4%	1.4%
Miller	24,863	8,976	2,251	9.8%	1.1%
Mississippi	14,271	5,323	1,274	6.7%	1.0%
Monroe	8,798	3,481	1,403	9.4%	0.5%
Montgomery	12,128	4,715	1,603	8.2%	0.7%
Morgan	20,392	5,968	1,581	9.2%	1.2%
New Madrid	18,695	8,760	1,207	7.1%	0.9%
Nodaway	23,347	11,122	2,349	13.6%	1.4%
Oregon	10,935	4,198	1,521	6.4%	1.3%
Ozark	9,653	2,692	1,005	7.8%	0.4%
Pemiscot	18,160	7,427	1,327	6.0%	0.8%
Perry	19,001	12,535	2,336	10.3%	1.8%
Pettis	42,146	23,778	3,783	10.0%	6.6%
Phelps	44,969	22,345	3,316	15.0%	4.0%
Pike	18,579	7,632	1,580	6.9%	0.9%
Pulaski	52,795	29,294	2,536	13.2%	5.3%
Putnam	4,944	1,796	678	7.7%	1.1%
Ralls	10,206	4,410	692	8.8%	0.1%
Randolph	25,253	12,344	2,211	8.7%	0.4%
Reynolds	6,661	2,595	708	4.4%	0.3%
Ripley	14,071	4,614	1,389	7.2%	0.8%
Saline	23,324	11,283	1,924	11.2%	5.7%
Schuylerville	4,397	1,309	597	6.8%	1.8%
Scotland	4,859	1,972	694	11.8%	0.4%
Scott	39,216	19,807	3,988	9.4%	0.8%
Shannon	8,388	2,842	1,252	5.8%	0.5%
Shelby	6,274	2,584	695	7.8%	1.0%
St. Clair	9,649	2,725	876	7.3%	0.7%
St. Francois	65,602	29,469	5,116	9.2%	0.8%
Ste. Genevieve	17,996	7,125	1,200	7.9%	1.1%
Stoddard	29,860	13,911	3,403	8.2%	0.4%
Stone	31,817	14,339	7,534	10.0%	1.1%
Sullivan	6,611	3,167	673	7.8%	10.0%
Taney	52,412	32,219	3,203	13.1%	4.3%
Texas	25,830	8,189	1,775	8.7%	0.7%
Vernon	20,990	9,543	2,014	7.8%	1.6%
Washington	25,135	6,547	1,171	4.9%	1.1%
Wayne	13,437	3,845	1,002	7.1%	0.3%
Worth	2,129	1,121	608	9.2%	0.2%
Wright	18,643	5,601	1,026	7.6%	2.2%

Appendix 2 – 2 Infrastructure Data Tables

County	Percent of Pop with Access to Two or More ISP's	Interstate highway connection	Four-Lane Highway Connection
Adair	79%	No	Yes
Atchison	41%	Yes	No
Audrain	58%	No	Yes
Barry	39%	No	Yes
Barton	14%	Yes	No
Benton	16%	No	Yes
Butler	63%	No	Yes
Camden	44%	No	Yes
Carroll	53%	No	No
Carter	18%	No	Yes
Cedar	0%	No	No
Chariton	28%	No	No
Clark	1%	No	Yes
Cooper	48%	Yes	No
Crawford	52%	Yes	No
Dade	36%	No	No
Davies	4%	Yes	No
Dent	50%	No	No
Douglas	24%	No	No
Dunklin	73%	No	Yes
Gasconade	22%	No	No
Gentry	34%	No	No
Grundy	59%	No	No
Harrison	44%	Yes	No
Henry	47%	No	Yes
Hickory	14%	No	No
Holt	27%	Yes	No
Howard	0%	No	No
Howell	43%	No	Yes
Iron	47%	No	No
Johnson	52%	No	Yes
Knox	2%	No	No
Laclede	51%	Yes	No
Lawrence	63%	Yes	Yes
Lewis	1%	No	Yes
Linn	61%	No	Yes
Livingston	63%	No	Yes
Macon	55%	No	Yes
Madison	54%	No	Yes
Maries	0%	No	Yes
Marion	72%	No	Yes

County	Percent of Pop with Access to Two or More ISP's	Interstate highway connection	Four-Lane Highway Connection
Mercer	0%	No	No
Miller	34%	No	Yes
Mississippi	65%	Yes	No
Monroe	41%	No	No
Montgomery	43%	Yes	No
Morgan	49%	No	No
New Madrid	74%	Yes	No
Nodaway	61%	No	Yes
Oregon	0%	No	Yes
Ozark	0%	No	No
Pemiscot	68%	Yes	No
Perry	53%	Yes	No
Pettis	60%	No	Yes
Phelps	64%	Yes	No
Pike	3%	No	Yes
Pulaski	45%	Yes	No
Putnam	1%	No	No
Ralls	54%	No	Yes
Randolph	57%	No	Yes
Reynolds	6%	No	No
Ripley	0%	No	No
Saline	78%	Yes	Yes
Schuyler	4%	No	No
Scotland	1%	No	No
Scott	72%	Yes	Yes
Shannon	0%	No	Yes
Shelby	40%	No	Yes
St. Clair	29%	No	Yes
St. Francois	73%	No	Yes
Ste. Genevieve	29%	Yes	No
Stoddard	52%	No	Yes
Stone	45%	No	No
Sullivan	0%	No	No
Taney	75%	No	Yes
Texas	30%	No	Yes
Vernon	51%	Yes	No
Washington	1%	No	No
Wayne	16%	No	Yes
Worth	2%	No	No
Wright	39%	No	Yes

Appendix 2 – 3 Entrepreneurial Depth and Breadth Tables

County	Depth - Income	Breadth	County	Depth - Income	Breadth
Adair	\$21,666	0.21	Mercer	\$11,871	0.43
Atchison	\$17,306	0.34	Miller	\$19,127	0.25
Audrain	\$26,121	0.26	Mississippi	\$30,296	0.24
Barry	\$16,228	0.27	Monroe	\$15,212	0.40
Barton	\$19,560	0.34	Montgomery	\$18,127	0.34
Benton	\$17,322	0.43	Morgan	\$21,373	0.26
Butler	\$29,975	0.19	New Madrid	\$25,171	0.14
Camden	\$19,471	0.34	Nodaway	\$22,186	0.21
Carroll	\$25,156	0.35	Oregon	\$14,855	0.36
Carter	\$17,985	0.37	Ozark	\$12,995	0.37
Cedar	\$15,830	0.43	Pemiscot	\$23,461	0.18
Chariton	\$26,565	0.46	Perry	\$14,476	0.19
Clark	\$20,467	0.41	Pettis	\$24,306	0.16
Cooper	\$14,692	0.26	Phelps	\$22,863	0.15
Crawford	\$38,360	0.36	Pike	\$18,481	0.21
Dade	\$14,095	0.39	Pulaski	\$19,483	0.09
Daviess	\$16,766	0.48	Putnam	\$18,555	0.38
Dent	\$18,944	0.30	Ralls	\$14,760	0.16
Douglas	\$19,361	0.60	Randolph	\$52,441	0.18
Dunklin	\$26,279	0.19	Reynolds	\$9,979	0.27
Gasconade	\$14,088	0.29	Ripley	\$19,298	0.30
Gentry	\$12,023	0.27	Saline	\$43,899	0.17
Grundy	\$16,545	0.25	Schuylerville	\$14,886	0.46
Harrison	\$17,327	0.28	Scotland	\$23,673	0.35
Henry	\$20,441	0.21	Scott	\$43,945	0.20
Hickory	\$11,084	0.45	Shannon	\$18,590	0.44
Holt	\$12,919	0.39	Shelby	\$27,750	0.27
Howard	\$15,572	0.29	St. Clair	\$23,910	0.32
Howell	\$20,023	0.22	St. Francois	\$16,166	0.17
Iron	\$12,399	0.23	Ste. Genevieve	\$12,942	0.17
Johnson	\$18,100	0.26	Stoddard	\$22,515	0.24
Knox	\$21,608	0.40	Stone	\$21,168	0.53
Laclede	\$23,210	0.21	Sullivan	\$22,823	0.21
Lawrence	\$18,694	0.23	Taney	\$20,685	0.10
Lewis	\$14,186	0.27	Texas	\$16,937	0.22
Linn	\$20,981	0.25	Vernon	\$19,344	0.21
Livingston	\$25,351	0.20	Washington	\$16,477	0.18
Macon	\$26,432	0.26	Wayne	\$17,683	0.26
Madison	\$14,301	0.23	Worth	\$4,972	0.54
Maries	\$20,890	0.64	Wright	\$6,019	0.18
Marion	\$22,125	0.19			

Appendix 2 – 4 Commuting Data Table

County	% Work Outside Home County	County	% Work Outside Home County
Adair	12.6%	Mercer	29.5%
Atchison	33.1%	Miller	45.8%
Audrain	25.2%	Mississippi	35.3%
Barry	29.0%	Monroe	55.7%
Barton	35.5%	Montgomery	46.4%
Benton	37.6%	Morgan	40.4%
Butler	10.1%	New Madrid	38.5%
Camden	20.3%	Nodaway	15.5%
Carroll	36.8%	Oregon	32.4%
Carter	47.4%	Ozark	39.8%
Cedar	39.7%	Pemiscot	28.5%
Chariton	46.3%	Perry	26.6%
Clark	50.4%	Pettis	15.2%
Cooper	40.1%	Phelps	16.0%
Crawford	47.9%	Pike	26.5%
Dade	45.1%	Pulaski	10.2%
Daviess	52.3%	Putnam	33.7%
Dent	32.7%	Ralls	66.4%
Douglas	38.5%	Randolph	20.4%
Dunklin	37.1%	Reynolds	25.0%
Gasconade	39.1%	Ripley	36.5%
Gentry	33.3%	Saline	47.6%
Grundy	26.6%	Schuylerville	42.6%
Harrison	30.5%	Scotland	28.5%
Henry	31.4%	Scott	17.8%
Hickory	47.2%	Shannon	55.8%
Holt	40.4%	Shelby	27.6%
Howard	52.6%	St. Clair	38.9%
Howell	9.9%	St. Francois	36.9%
Iron	44.8%	Ste. Genevieve	38.7%
Johnson	29.0%	Stoddard	29.5%
Knox	44.6%	Stone	52.7%
Laclede	19.5%	Sullivan	23.2%
Lawrence	46.3%	Taney	12.1%
Lewis	47.2%	Texas	34.2%
Linn	23.1%	Vernon	17.7%
Livingston	16.9%	Washington	53.4%
Macon	29.9%	Wayne	35.7%
Madison	39.0%	Worth	45.5%
Maries	64.0%	Wright	35.0%
Marion	24.6%		

Appendix 2 – 5 Location Quotient- Arts, Accommodation, and Agriculture Industries

County	Arts	Accommodation	Agriculture	County	Arts	Accommodation	Agriculture
Adair	0.78	1.48	2.18	Marion	1.10	1.00	3.16
Atchison	0.60	1.43	3.55	Mercer	0.00	0.00	0.27
Audrain	0.72	0.52	4.24	Miller	2.20	0.90	0.95
Barry	0.21	0.64	6.83	Mississippi	0.16	0.71	3.05
Barton	0.14	1.64	3.01	Monroe	1.10	0.78	2.53
Benton	0.90	1.25	0.69	Montgomery	0.73	0.88	3.61
Butler	0.33	0.99	0.39	Morgan	0.57	1.35	1.61
Camden	2.35	2.09	0.25	New Madrid	0.00	0.00	3.19
Carroll	0.93	0.80	4.23	Nodaway	0.27	1.46	1.60
Carter	0.00	0.00	1.46	Oregon	0.00	0.00	2.25
Cedar	0.61	1.24	2.59	Ozark	0.00	1.75	3.82
Chariton	0.35	0.69	4.10	Pemiscot	0.00	0.00	2.13
Clark	0.00	0.00	3.15	Perry	0.00	0.00	5.55
Cooper	0.22	2.09	1.51	Pettis	0.51	0.83	3.65
Crawford	0.23	0.87	1.43	Phelps	0.47	1.38	0.92
Dade	0.00	0.00	14.98	Pike	1.17	0.77	2.54
Daviess	0.86	0.99	1.79	Pulaski	0.20	2.75	0.40
Dent	0.26	0.90	0.77	Putnam	0.00	0.00	6.09
Douglas	0.00	0.00	1.37	Ralls	0.19	0.38	0.74
Dunklin	0.23	0.73	1.92	Randolph	0.49	0.85	0.30
Gasconade	0.00	0.00	3.05	Reynolds	0.30	0.63	2.80
Gentry	0.09	0.47	1.83	Ripley	0.24	0.84	1.06
Grundy	0.20	0.79	6.93	Saline	0.98	0.72	9.13
Harrison	0.00	0.00	2.12	Schuylerville	0.00	0.00	1.11
Henry	0.58	1.19	4.42	Scotland	1.06	0.85	4.84
Hickory	5.19	1.10	2.12	Scott	0.17	1.39	3.73
Holt	0.44	1.25	4.66	Shannon	0.00	0.00	1.35
Howard	0.00	0.00	1.94	Shelby	0.00	0.00	2.77
Howell	0.34	0.82	1.07	St. Clair	0.00	0.61	1.23
Iron	0.13	0.50	0.03	St. Francois	0.38	1.05	1.41
Johnson	0.00	0.00	0.07	Ste. Genevieve	0.33	0.82	1.41
Knox	0.00	0.00	6.38	Stoddard	0.22	0.64	5.10
Laclede	0.27	0.89	1.57	Stone	2.33	1.73	0.33
Lawrence	0.27	1.02	3.34	Sullivan	0.00	0.00	23.25
Lewis	0.00	0.00	0.97	Taney	7.21	2.81	0.15
Linn	0.00	0.00	0.95	Texas	0.17	0.89	3.07
Livingston	0.29	0.79	2.22	Vernon	0.00	0.00	3.02
Macon	0.19	1.36	4.99	Washington	0.23	0.66	1.36
Madison	0.18	0.80	1.85	Wayne	0.00	0.00	3.90
Maries	0.00	0.43	8.10	Worth	0.00	0.63	0.82
				Wright	0.48	0.91	2.56

Appendix 2 – 6 Top and Secondary Employing Industries

County	Top Industry	Secondary Industry	County	Top Industry	Secondary Industry
Adair	Government/Education	Government/Education	Marion	Manufacturing	Manufacturing
Atchison	Agriculture	Agriculture	Mercer	Agriculture	Agriculture
Audrain	Tourism	Manufacturing/Tourism	Miller	Tourism	Tourism
Barry	Manufacturing	Manufacturing	Mississippi	Diversified	Diversified
Barton	Manufacturing	Manufacturing	Monroe	Manufacturing	Manufacturing
Benton	Diversified	Manufacturing/Tourism	Montgomery	Manufacturing	Manufacturing
Butler	Manufacturing	Manufacturing	Morgan	Tourism	Diversified
Camden	Tourism	Tourism	New Madrid	Manufacturing	Manufacturing
Carroll	Diversified	Agriculture/Manufacturing	Nodaway	Manufacturing	Manufacturing
Carter	Diversified	Manufacturing/Tourism	Oregon	Diversified	Manufacturing/Tourism
Cedar	Diversified	Diversified	Ozark	Tourism	Manufacturing/Tourism
Chariton	Diversified	Diversified	Pemiscot	Manufacturing	Manufacturing
Clark	Manufacturing	Manufacturing	Perry	Manufacturing	Manufacturing
Cooper	Diversified	Diversified	Pettis	Manufacturing	Manufacturing
Crawford	Manufacturing	Manufacturing	Phelps	Government/Education	Government/Education
Dade	Manufacturing	Agriculture/Manufacturing	Pike	Diversified	Diversified
Daviess	Diversified	Agriculture	Pulaski	Government/Education	Government/Education
Dent	Tourism	Tourism	Putnam	Agriculture	Agriculture
Douglas	Tourism	Manufacturing/Tourism	Ralls	Manufacturing	Manufacturing
Dunklin	Manufacturing	Manufacturing	Randolph	Diversified	Diversified
Gasconade	Manufacturing	Manufacturing	Reynolds	Agriculture	Agriculture
Gentry	Diversified	Agriculture/Manufacturing	Ripley	Manufacturing	Manufacturing
Grundy	Manufacturing	Manufacturing	Saline	Diversified	Diversified
Harrison	Diversified	Agriculture	Schuylerville	Manufacturing	Manufacturing
Henry	Manufacturing	Manufacturing/Tourism	Scotland	Government/Education	Government/Education
Hickory	Tourism	Tourism	Scott	Manufacturing	Manufacturing
Holt	Agriculture	Agriculture	Shannon	Manufacturing	Manufacturing
Howard	Government/Education	Government/Education	Shelby	Tourism	Agriculture/Manufacturing
Howell	Manufacturing	Manufacturing	St. Clair	Manufacturing	Manufacturing/Tourism
Iron	Government/Education	Government/Education	St. Francois	Manufacturing	Manufacturing
Johnson	Government/Education	Government/Education	Ste. Genevieve	Diversified	Diversified
Knox	Agriculture	Agriculture	Stoddard	Manufacturing	Manufacturing
Laclede	Manufacturing	Manufacturing	Stone	Tourism	Tourism
Lawrence	Manufacturing	Manufacturing	Sullivan	Manufacturing	Agriculture/Manufacturing
Lewis	Manufacturing	Agriculture/Manufacturing	Taney	Tourism	Tourism
Linn	Manufacturing	Manufacturing	Texas	Government/Education	Government/Education
Livingston	Diversified	Diversified	Vernon	Diversified	Diversified
Macon	Diversified	Diversified	Washington	Manufacturing	Manufacturing
Madison	Manufacturing	Manufacturing	Wayne	Manufacturing	Manufacturing/Tourism
Maries	Government/Education	Government/Education	Worth	Agriculture	Agriculture/Manufacturing
			Wright	Manufacturing	Agriculture/Manufacturing

Notes

1. County population, percent of population Age 25+ with a Bachelors Degree, and percent of population foreign born were from the U.S. Census Bureau 2009 – 2013 Five-Year American Community Survey (ACS) estimates. Commuting data is from U.S. Census Bureau 2006-2010 county work flows.
2. Internet access data was collected from the Federal Communications Commission via the National Telecommunications and Information Administrative via www.broadbandmap.gov. Data collected is on population with access to ISP's that provide high-speed broadband internet.
3. 2013 total employment, non-farm proprietor, and total proprietor income data to calculate entrepreneurial breadth and depth is from the U.S. Department of Commerce, Bureau of Economic Analysis.
4. Entrepreneurial breadth is calculated by:

$$Breadth = \frac{\text{total non-farm proprietor employment}}{\text{total non-farm employment}}$$

Entrepreneurial Depth is calculated by:

$$Depth = \frac{\text{Total non-farm proprietor income}}{\text{non-farm proprietor employment}}$$

5. 2013 *Arts, Entertainment and Recreation, Accommodation and Food Service*, and 2012 *Agriculture* industry employment data to calculate location quotients is from the U.S. Department of Labor, Bureau of Labor Statistics. Location quotient is calculated by this formula:

$$LQ = \frac{e_i/e}{E_i/E}$$

Where:

e_i = Local employment in industry i

e = Total local employment

E_i = Reference area employment in industry i

E = Total reference area employment

6. Economic Catalyst

6a. Categories for Agriculture, Manufacturing, and the combined Education/Government sectors are defined by the ACS. Tourism is not easily defined but a proxy of the combined employment in Arts/Entertainment/Recreation, Accommodations and Food Service, and Retail Trade were used in this analysis. Retail trade is overly influential but using the other two sectors alone is likely undercounting tourism in outdoor activities that do not result in accommodation and food services employment but are common around the state's lakes and scenic rivers. In addition, park employees are counted in government employment.

6b. The definition of "economic catalyst" is not set solely by industry sectors and involves some ambiguity that is unavoidable. The influence of tourism, for example, is often hard to define as sectors in that group serve both local and traveling customers. The definitions below, however, are an attempt to use general criteria to understand which export-oriented industries or institutions have a large impact on resident incomes. It should not be viewed as the only sectors of economic importance but as a tool to understand existing strengths in a county.

Definitions of top industries:

- 1) **Agriculture** – Minimum criterion: percent of agriculture employment is at least twice the 6.1% average of all counties.
- 2) **Agriculture/Manufacturing** – Minimum criterion: percent of agricultural employment is equal or greater than 10% and together with manufacturing are equal or greater than 25% of all employment.
- 3) **Manufacturing** – Minimum criterion: percent of manufacturing employment is equal or greater than the 16.7% average of all counties and is the top industry.
- 4) **Manufacturing/Tourism** – Minimum criterion: manufacturing and tourism-related sectors are the top employing industries and roughly the same size.
- 5) **Tourism** - Minimum criterion: 20% percent or greater of combined employment in tourism-related sectors and is the top industry.
- 6) **Education/Government** - Minimum criterion: 20% percent or greater of combined employment in education/government sectors and is the top industry.
- 7) **Diversified** – Minimum criterion: 3 or more basic sectors or in combination with professional services had roughly the same size

Sources

Federal Communications Commission, broadbandmap.gov. (2014). Number of Wireline Service Providers Greater Than 2. Retrieved from <http://www.broadbandmap.gov/rank/all/county/missouri/percent-population/number-of-wireline-service-providers-greater-than-2/ascending/>.

Low, S., Henderson, J., & Weiler, S. (2005). Gauging a Region's Entrepreneurial Potential. Federal Reserve Bank of Kansas City.

Missouri Economic Research and Information Center. (2015). *Missouri Economic Research Brief: Agricultural Industries*. Retrieved from: https://www.missourieconomy.org/pdfs/agriculture_industry_brief_2015.pdf

2008-2013 American Community Survey 5-Year Estimates, Table S1501; generated by Maurice Harris; using American FactFinder; <<http://factfinder2.census.gov>>; (7 August 2015).

"DP02: Selected Social Characteristics in the United States—Foreign-Born Population—Missouri." Data Set: American Community Survey, 2008-2013. Available at American Fact Finder (Census Bureau), <http://factfinder2.census.gov>; Accessed 8/7/2015.

"S1501: Educational Attainment—Population 25 Years and Over—Missouri." Data Set: American Community Survey, 2008-2013. Available at American Fact Finder (Census Bureau), <http://factfinder2.census.gov>; Accessed 8/7/2015.

U.S. Department of Agriculture, Economic Research Services. (2007). "Population Dynamics Are Changing the Profile of Rural Areas." <http://www.ers.usda.gov/amber-waves/2007-april/population-dynamics-are-changing-the-profile-of-rural-areas.aspx#.Vdc63vlViko>. Accessed 8/19/2015.

U.S. Department of Commerce, Bureau of Economic Analysis. (2013). Economic Profile Table – Missouri. <http://www.bea.gov/itable/iTable.cfm?ReqID=70&step=1#reqid=70&step=1&isuri=1>. Accessed: 8/10/2015.

U.S. Department of Labor, Bureau of Labor Statistics. (2013). Quarterly Census of Employment and Wages data – Missouri 2013 Annual Average Data. Retrieved from http://www.bls.gov/cew/apps/data_views/data_views.htm#tab=Tables.



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